

ATTACHMENT 7

PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

7.1 EQUIPMENT REQUIREMENTS [40 CFR 264.32; R315-8-3.3]

This section describes the internal and external communication system, emergency equipment, and water for fire control that will be available for the Munitions Management Device, Version 1 (MMD-1) test that will be conducted at the U.S. Army Dugway Proving Ground (DPG) Building 3445.

7.1.1 Internal Communications [40 CFR 264.32(a); R315-8-3.3(a)]

Internal communications consist of intercoms, throat mikes, hand-held radios, and headsets and will be used to communicate among the MMD-1 control room, control trailer, and process trailer and the workers in Building 3445, East Chamber, Building 3445 control booth, change area/shower, break vans, instrumentation van, and photo van. Radio and headset equipment will also be made available when personnel are required to use self-contained breathing apparatus (SCBA) equipment or supplied air, and the "two-man rule" will be invoked to ensure personnel safety when working on contaminated or "hot" equipment. **Table 7-1** summarizes the locations of internal communication equipment to be used during MMD-1 testing.

Non-routine operating conditions, including the release of chemical agents or industrial chemicals, will be conveyed to workers using the internal communication system described above.

The MINICAMS⁷ monitoring of the workspaces listed above will be set to alarm at 70 percent of the time-weighted average hazard level for H, HD, CG, GB, and VX. Should chemical agents or industrial chemicals be detected above the established alarm level, an alarm will sound in the safety/monitoring room. The MINICAMS⁷ operator will notify workers in the area by radio and/or intercom of the incident.

The MMD-1 Test Director or his designee will then evaluate the situation and inform the DPG Test Director of the situation and obtain direction. In the event of an emergency, the DPG Test Director or his designee will telephone the local emergency number to alert onsite response organizations, who in turn will notify outside agencies, such as the National Response Center (800-424-8802), if required.

7.1.2 External Communications [40 CFR 264.32(b); R315-8-3.3(b), 3.5]

The telephone is the primary mechanism used to summon emergency assistance from DPG security, fire department, and emergency response teams. Two-way radios may also be available to summon external assistance in an emergency. All personnel who work in Building 3445 will be required to be in direct visual or voice contact with persons who have immediate access to a landline telephone. Telephone locations are presented in **Table 7-1**.

7.1.3 Emergency Equipment [40 CFR 264.32(c); R315-8-3.3]

Equipment for spill control, personal protection, decontamination, monitoring and surveying, and fire control will be available at Building 3445, East Chamber to respond to emergencies. **Table 7-2** describes the emergency equipment available at Building 3445, and specific MMD-1 emergency equipment. **Figure 7-1** shows the locations of telephones, intercoms, fire extinguishers, spill-control equipment, and emergency eyewash/showers.

Table 7-1. Internal and External Communication System, Building 3445, Carr Facility

Location	System						
	Headsets, Hand-Held Radios, and Throat Mikes	Intercom	Telephone				
			Class A Line (801) 831-5136	Class C Line (801) 831-5384	Class C Line (801) 831-5514	Class C Line (801) 831-5295	Class C Line (801) 831-5203
Building 3445:							
Administrative Trailer	X						
East Chamber	X	X					
Control Room	X	X	X	X	X		
Shower/Change Area		X	X	X	X		
Break Van		X	X	X	X		
Lockheed Break Van			X	X	X		
Instrumentation Van		X				X	
Photo Van							X
Safety/Air Monitoring		X					
MMD-1:							
Control Trailer	X	X					
Process Trailer	X	X					

NOTES:

Class A = Communication access within and outside the Dugway Proving Ground installation

Class C = Communication access within the Dugway Proving Ground installation

7.1.4 Water for Fire Control [40 CFR 264.32(d); R315-8-3.3]

One mechanism for fire control during MMD-1 operations will be hand-held fire extinguishers. There will be two ABC-type fire extinguishers at various locations (see **Figure 7-1**) at Building 3445: one 20-A:120-B:C (35-pound) extinguisher in the East Chamber, and one 4-A:60-B:C (20-pound) extinguisher in the shower/change area. In addition, a fire hydrant is located at the southwest corner of the Building 3445 facility fence should water be required for firefighting. The MMD-1 process trailer has a fire-resistance design comprising a combination of fire barriers, fire-suppression equipment, and fire-detection equipment. More detail about the process trailer fire-protection system is presented in Section 5.

The MMD-1 will only process one munition or Department of Transportation (DOT) container of chemical agent or industrial chemical (less than 250 pounds of materiel) at a time, and all MMD-1 operations will be contained within the MMD-1 system.

Table 7-2. MMD-1 Site Operations Emergency Equipment

Equipment	Capability	Quantity	Equipment Location
Hand tools	Small spill cleanup \$ shovels \$ brooms \$ mops	Two each	Building 3445, East Chamber
Portable wet/dry shop vacuum	Small to medium spill cleanup	One	Building 3445, West Chamber
Fire extinguisherABC	Handheld	Two	Building 3445, Change Area/Shower
MMD-1 Spill kit	Hazardous Waste Cleanup \$ 55-gallon salvage drum (1) \$ polyethylene shovel (1) \$ 50-lb bags Labsorb ^J absorbent (30) \$ 2 pair Tyvek polylaminated coveralls \$ 2 pair Nitrile rubber gloves \$ 2 pair fog-free goggles \$ 25 foot nylon rope (1) \$ duct tape (2)	Two	Building 3445, East Chamber, Building 3445, West Chamber
Ambulance ^a	\$ Emergency Medical Technicians (2) \$ medical supplies including Mark I kits \$ stretcher \$ trauma kit	One	Building 3445 Parking Lot

NOTES:

- a The ambulance and emergency medical technicians will only be present during MMD-1 detoxification operations; otherwise, they will be on 15 minute standby

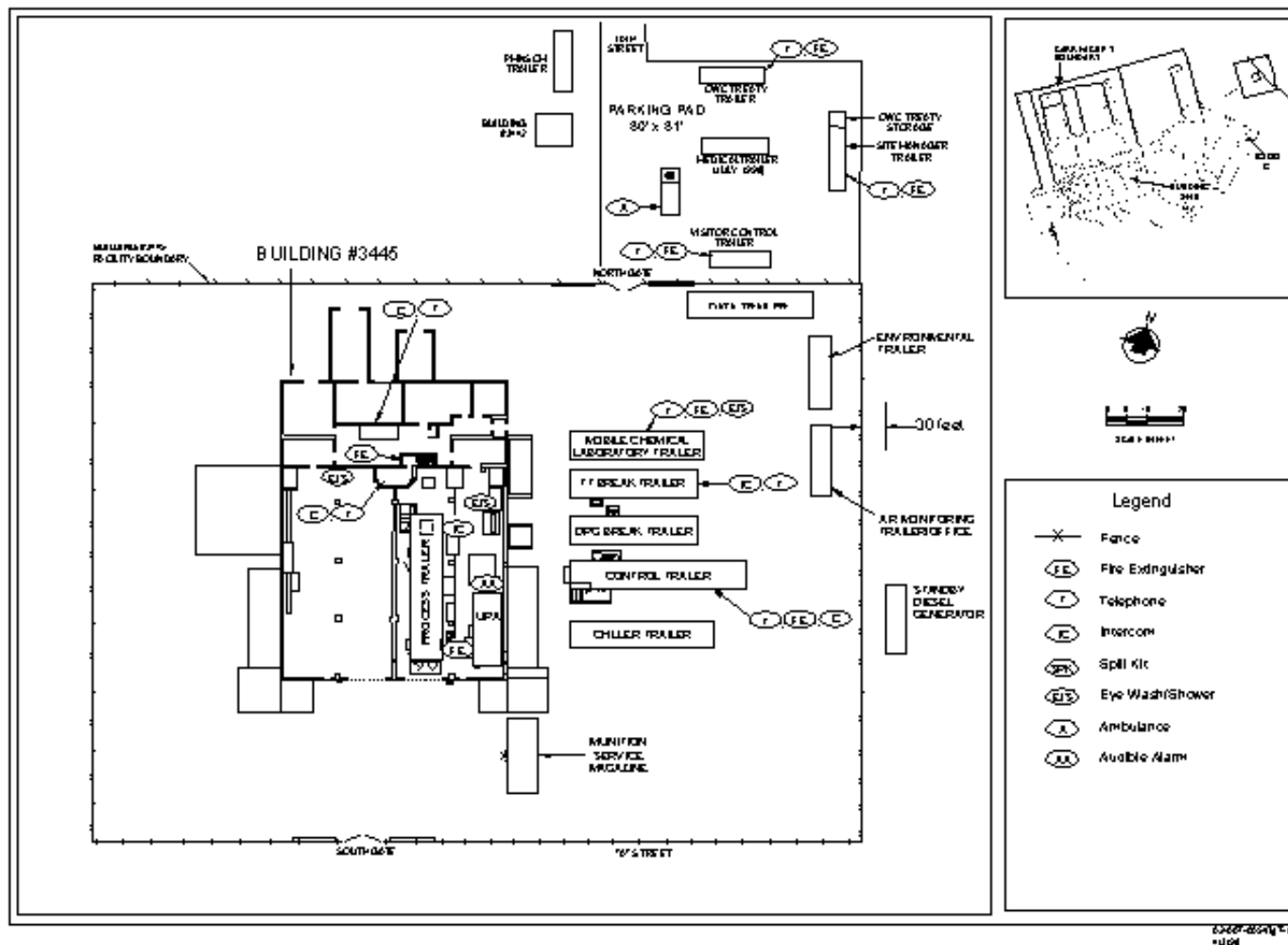


Figure 7-1. Location of Telephones, Intercoms, Fire Extinguishers, Spill Control Equipment, and Emergency Eyewash/Showers

7.2 UNLOADING OPERATIONS [40 CFR 264.31; R315-8-3.3]

The MMD-1 detoxification of chemical agents and industrial chemicals will be primarily accomplished in the process trailer once a chemical warfare materiel (CWM) item or a DOT container is loaded into the Munitions Treatment Vessel (MTV). Specific structures and container-handling equipment will be used to prevent hazards when the CWM or DOT container is delivered to Building 3445 and when the CWM or DOT container is loaded into the MTV for treatment.

CWM items recovered from burial sites are currently stored in Igloo G and will be transported directly to the Munition Service Magazine (MSM) located at the Building 3445 facility. Most CWM are packaged inside a steel container (called a PIG) or other overpack containers, such as a propellant charge can. A PIG is a steel pipe-like container, sealed at one end, with a flange opening at the other end that is closed by a gasket and steel plate (called a flange blank) and secured with eight bolts. A propellant charge can is a 1/8-inch steel pipe-like container, sealed at one end with a rubber gasket, with a clamp-on lid that engages the container's seal.

Hazards in CWM unloading operations from the MSM to the unpack area (UPA), in the UPA, and at the process trailer will be minimized through the following:

- \$ Inspection of CWM items at Igloo G prior to transport and transfer into the MSM at Building 3445, to ensure no leakage.
- \$ At Igloo G, leaking CWM items will be detected using MINICAMS⁷. If leaks are detected, then the leaking CWM item will be patched and re-containerized. The re-containerized CWM item could then be transported to the MSM for treatment in the MMD-1 system or remain at Igloo G.
- \$ Use of an overpack transfer cart with locking attachment to secure the CWM item to be treated during transfer from the MSM to the UPA in Building 3445, East Chamber.
- \$ Adequate space to allow for unobstructed movement of the transfer carts during unloading of CWM or DOT containers in the UPA, transfer of CWM or DOT containers from the UPA to the MMD-1 process trailer, and loading of CWM or DOT containers into the MTV.
- \$ Small Burials Contractor (SBC) and DPG personnel will be present at all times during CWM or DOT container unloading operations; therefore, any spilled or leaked materiel will be immediately detected and cleaned up in accordance with the procedures for nonroutine operations described in Section 5 of this permit application.
- \$ Easy access to emergency and safety equipment in the UPA and Building 3445 will facilitate quick emergency response (see Section 7.1.1).
- \$ MMD-1 operators will be trained in CWM and DOT container loading and unloading procedures and spill containment and response procedures as described in Section 12 of this permit application.

7.3 RUN-ON AND RUNOFF PREVENTION [40 CFR 264.31; R315-8-3.2]

Run-on and runoff from the MMD-1 operations will be prevented by the following:

- \$ Chemical agent detoxification processes will occur in the MMD-1, an engineering-controlled system that will be housed within Building 3445, East Chamber. The process trailer and Building 3445 will provide confinement of waste materials.
- \$ The MMD-1 detoxification process will handle only small amounts of chemical agent or industrial chemical within the enclosed MMD-1.
- \$ There are no drains within the MMD-1 or Building 3445 to allow any released liquid to migrate outside these confinement structures.
- \$ Secondary containment within the process trailer will be provided by a stainless steel floor pan and sump that will minimize the release of liquid. All seams in the trailer will be sealed (leak-tight); therefore, no liquid will be able to leak out of the process trailer into the Building 3445, East Chamber.
- \$ Any spill outside the MMD-1 system will be contained within Building 3445, and will be immediately cleaned up.
- \$ The reagent storage tanks and the surge tanks will have secondary containment.

7.4 WATER SUPPLIES [40 CFR 264.31; R315-8-3.2]

Contamination of water supply resources in the vicinity of Building 3445 by treatment activities within the MMD-1 process trailer will be mitigated by locating the process trailer within Building 3445, East Chamber, the overall design of the process trailer and MMD-1 process systems, and the small quantities of chemical agent or industrial chemical that will be detoxified at a time. The MMD-1 system and Building 3445 are designed to prevent any waste releases from process activities from entering the environment.

Should any chemical agent or industrial chemical be spilled outside the process trailer (which will be located within Building 3445, East Chamber), migration of the chemical will be prevented by Building 3445, East Chamber's stainless steel walls and floor. Building 3445 (East and West Chambers) does not have drains or other floor openings. Any liquid spilled will be collected by secondary containment then either pumped into DOT-approved containers or absorbed using compatible absorbent materials such as granules, pillows, sheets, or socks. Absorbed or pumped materials will be properly containerized and managed as hazardous waste.

The design features previously described will prevent waste releases to the soil that could eventually migrate to groundwater at the Building 3445 location. Any spill detected inside or outside the process trailer or within the East or West Chamber of Building 3445 will be immediately cleaned up, thus preventing any release from migrating out of the building.

Contamination of the DPG water supply from MMD-1 test operations will be highly unlikely because of the following:

- \$ The closest groundwater extraction wells to Building 3445 are DPG Wells Number 4, 5, and 29. Well Number 4 is an inactive potable water well. Well Number 5 is an active potable water well located more than 1,200 feet from Building 3445. **Figure 7-2** shows the location of Wells Number 4 and 5 relative to Building 3445. Well 29 is an active stand-by well but is located more than 2 miles from Building 3445. These wells were completed to depths ranging from 270 to 320 feet below ground surface.
- \$ The MMD-1 will treat only small quantities of chemical agent or industrial chemicals.
- \$ The MMD-1 will be located inside a process trailer that will be housed inside a stainless steel test chamber (Building 3445, East Chamber). The stainless steel floor and walls will contain any release. There are no floor drains or other openings that will allow a release to soil or groundwater.
- \$ Any spill detected inside or outside the MMD-1 process trailer will immediately be cleaned up once the MMD-1 system is brought to a safe and stable condition.

7.5 EQUIPMENT AND POWER FAILURE

7.5.1 Power Supply Failure

The MMD-1 electrical distribution system will consist of a 480V, three-phase system; a 120V, single-phase system; and a 120V uninterruptible power supply (UPS) system. The main source of power for the MMD-1 treatment operations will be the 480V supply. The 120V system will provide power for loads such as lighting, receptacles, fire-protection panels, and battery charger. The 120V UPS system will provide power for MMD-1 electrical equipment and instrumentation sensitive to power fluctuations and will provide power for MMD-1 critical electrical needs to ensure safe suspended operations until the stand-by diesel generator becomes operational.

A stand-by diesel generator will be provided with the MMD-1 to provide power if the main source of 480V power is unavailable. The stand-by diesel generator, rated at 125 kW, is self-contained and skid-mounted with a weather-protective enclosure. Building 3445 electrical service will be routed to the MMD-1 control trailer to provide the main power supply for the MMD-1. The MMD-1 stand-by diesel generator will be used as a backup power supply. Building 3445 stand-by power consists of several portable backup generators capable of supplying stand-by power to Building 3445 and MMD-1 operations.

Should the main power supply to the MMD-1 fail, the MMD-1 stand-by diesel generator will start within 10 seconds and provide a reduced power capability for the MMD-1. During the interval period when power is lost and the stand-by diesel generator re-energizes the 480V bus, critical electrical loads will be powered by the UPS system. In the unlikely event that the MMD-1 stand-by diesel generator does not start, the UPS batteries will provide power for a minimum of 15 minutes for critical electrical loads. During this time, MMD-1 operators will secure MMD-1 operations and attempt to start the MMD-1 stand-by diesel generator manually.

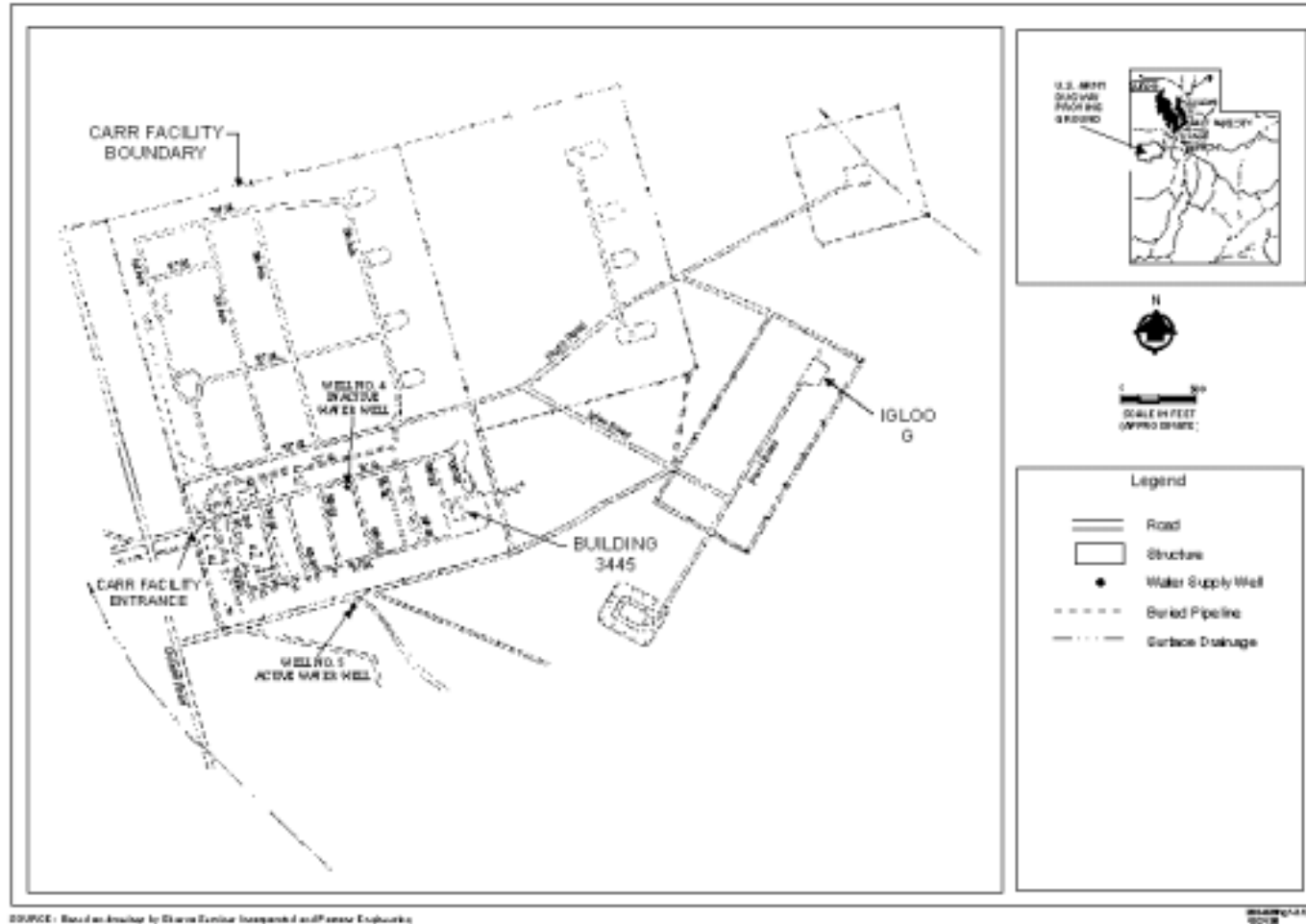


Figure 7-2. Location of Groundwater Extraction Wells in Vicinity of Building 3445, Carr Facility

The initial response to a power failure or interruption will be to cease all detoxification operations or to continue processing until safe shutdown conditions are met and the MMD-1 is secured. During operations using stand-by power, power will be supplied to critical systems that are required to verify safe suspended operations. These systems include, but are not limited to, the monitoring system, the digital control and instrumentation system (DCIS), and the heating, ventilation, and air conditioning (HVAC) system. The monitoring system will provide information about chemical agents or industrial chemical concentrations and releases, the DCIS will provide process monitoring information about equipment and treatment status, and the HVAC will ensure that the MMD-1 carbon filtration unit is functioning.

7.5.2 Waste-Handling Equipment

The waste-handling equipment used within the UPA and MTV will be inspected periodically for deterioration and malfunctions. Preventive maintenance will be conducted to ensure peak operating performance. Should equipment fail, such as the transfer carts, or jib crane, unpack operations will cease until repairs or replacement can be completed. Equipment inspections are described in Section 6 of this application. In addition, all personnel who operate waste-handling equipment will be trained and qualified to use the appropriate equipment. These training requirements are described in Section 12 of this permit application.

7.6 PERSONAL PROTECTIVE EQUIPMENT

This section describes the personal protective equipment (PPE) that will be required for use by MMD-1 test personnel during MMD-1 testing and by visitors at Building 3445. The selection and use of PPE during MMD-1 operations and emergency response operations is based on the Department of the Army and Occupational Safety and Health Administration (OSHA) health and safety requirements.

7.6.1 General Requirements

The selection of PPE for the MMD-1 test is based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the location, specific conditions, duration of the activity, the actual or potential hazards identified, and the actual hazards identified through monitoring. Where hazards have not been fully evaluated, the highest level of protection required for the potential hazard will be specified until the evaluation is complete.

The following paragraphs and **Table 7-3** present the general OSHA and U.S. Army personal protective levels and associated PPE recommended for use for specific work tasks as defined in the MMD-1 Safety Health Emergency Response Plan (SHERP). These PPE levels will be considered to be preliminary until the SHERP is completed. If unexpected hazards at a site indicate the need for a level of PPE other than that listed in the SHERP, the plan will be modified subject to the approval of the DPG Safety Office. The U.S. Army Program Manager Chemical Demilitarization Risk and Management Division must be informed of the change prior to restarting work.

7.6.2 Visitor Requirements

During test operations of the MMD-1, visitors to Building 3445 will be restricted to the visitor control trailer. Prior to test operations, visitors will be given access to the grounds inside the Building 3445 fence boundary and access to the Building 3445, East Chamber control room, Building 3445, East Chamber equipment room, data control room, MMD-1 control room, and SBC laboratory. All visitors must wear safety glasses or equivalent eye protection, hard hats, and closed-toe shoes as minimum PPE, at all times.

7.6.3 MMD-1 Test Personnel Requirements

MMD-1 test personnel, including SBC and DPG personnel, will be required to wear appropriate PPE during MMD-1 operations. MMD-1 test personnel working within Building 3445 will be required to carry appropriate respiratory protection at all times. The PPE selected for MMD-1 test operations includes OSHA level A to OSHA level D. **Table 7-3** presents a summary of the primary MMD-1 operations, lists associated OSHA PPE, and presents a rationale for its selection. A description of OSHA levels A, B, C, and D, including a list of associated equipment, is presented in **Table 7-4**. The selection of PPE was based on the use of chemical agent monitors during MMD-1 operation. MINICAMS⁷ will provide a necessary warning of a release of any CWM. In addition to the monitoring equipment, the carbon filtration unit on the process trailer will help protect MMD-1 personnel inside Building 3445, East Chamber from any undue exposure to CWM released from MMD-1 operations inside the process trailer.

7.7 PREVENTION OF RELEASE TO THE ATMOSPHERE [40 CFR 264.31; R315-8-3.2]

The potential for gaseous waste release to the atmosphere from the MMD-1 will be minimized by the following design and waste management practices:

- \$ Inspections of the MMD-1 will be regularly conducted to provide prompt detection of leaks, spills, or potentially hazardous situations.
- \$ CWM will only be opened inside the UPA or in the MTV for detoxification inside the process trailer.
- \$ Detoxification will be performed in a controlled manner inside the MTV or liquid reactor vessel. Liquid wastes will be transferred to the surge tanks and subsequently to the bulk waste storage containers in the West Chamber after confirming that the chemical agent or industrial chemical has been detoxified to the performance goal levels presented in **Table 4-4**.
- \$ If leaks or spills outside engineering controls (for example, structures, process trailer) are detected, they will be immediately cleaned up in accordance with the contingency plan described in Section 10.
- \$ The exhaust air from the MMD-1 process trailer will be vented to carbon filters and will be monitored by historical/confirmation systems (DAAMS) before being vented to the interior of Building 3445, East Chamber. The exhaust air from Building 3445 will then be vented to the Building 3445 activated carbon filtration system and will be monitored by MINICAMS⁷ and historical/confirmation systems before being vented to the atmosphere.

These procedures and practices, combined with personnel training (as described in Section 12), will minimize the release of waste constituents.

**Table 7-3. Recommended Personal Protective Equipment for Munitions Management Device,
Version 1 Test**

Activity	Description of Operation	OSHA Level PPE ^c	Rationale for PPE Selection
Site visits to Building 3445, East Chamber ^a	Observe equipment and facility layout; observe control and laboratory facilities. No visitors will be allowed within Building 3445 fenced boundary during chemical agent detoxification and analysis.	Not required ^b	Activity will be performed outside facility boundary or when operations have been secured and the area contains no hazards requiring PPE.
Unpack CWM	Unpack, inspect, and repair CWM if needed, and prepare for processing in the MMD-1. Procedures conducted will ensure that chemical agent or industrial chemical liquids and vapors will be controlled and the work areas and personnel are protected.	Level A	Level A is required for protection because the chemical hazard is not completely characterized, or a potential chemical hazard requires the highest level of protection for the skin, eyes, and respiratory system.
Load CWM (for example, munition)	Open the process trailer and the MTV, move the munition/container from the unpack area to the process trailer, load the munition into the MTV, and close and seal the MTV and the process trailer. The process trailer and MTV are located inside Building 3445, East Chamber.	Level B	There is no possibility of contact with contamination in the MTV and with munitions leaking during movement.
Reagent Preparation	Prepare reagents for use in the liquid processing system. The reagent process system (specifically, the reagent storage tanks) will be skid-mounted and will be located outside the process trailer (inside Building 3445, East Chamber).	Level C	The chemical hazard is well-established and does present a hazard to the skin (from liquids which may splash on the worker) and the atmosphere contains 19.5-percent oxygen.
Manual Sample Collection	Transfer chemical agent or industrial chemical vapor samples collected from the MTV sample panel, located on the outside of the process trailer, to a laboratory located outside Building 3445, East Chamber (SBC or DPG laboratory). Air samples	Level C	The chemical hazard is well-established and does not present a hazard to the skin (from liquids which may splash on the worker).

Activity	Description of Operation	OSHA Level PPE ^c	Rationale for PPE Selection
Liquid Waste Treatment Residue Sampling	<p>will be transferred to steel gas sample cylinders, the cylinders will be placed in a sealed carrying case, and the carrying case will be transported to the SBC laboratory trailer. The process trailer and its sample panel are located inside Building 3445, East Chamber.</p> <p>After detoxification has been performed to the point that the neutralent waste stream is equal to or below performance levels, samples will be collected and transferred to the SBC laboratory for analysis. The surge tanks are skid-mounted and located inside Building 3445, East Chamber.</p>	Level C	The chemical hazard is well-established and presents a hazard to the skin (from liquids which may splash on the worker). The vapor hazard is not known at this time.
Solid Hazardous Waste Removal (from MTV)	Open the process trailer and the MTV, manually collect solid waste from inside the MTV, and place the solid waste in containers. The process trailer and MTV are located inside Building 3445, East Chamber.	Level A	The handling of materials in the MTV may present a hazard to the skin (from liquids or other direct contact) with surfaces that contain residual chemical agent or industrial chemical. The vapor hazard is not known at this time.
Chemical Agent, Industrial Chemical, and Non-chemical Agent Analysis in Onsite SBC Laboratory	Perform analysis of liquid and gas samples to identify the concentrations of chemical agent or industrial chemicals from gas and liquid samples collected at various locations in the MMD-1 process. Chemical agent, industrial chemical, and non-chemical agent analysis of liquids and gases will be performed in the SBC laboratory located adjacent to Building 3445.	Modified ^d Level D	The use of containment containers to transport samples and the use of ventilation hoods or other protection in the laboratory allows the use of minimum PPE.
Maintenance	Maintenance will be performed when all detoxification activity has been completed and all waste material removed and properly packaged.	Level B	The handling of materials in the MTV may present a hazard to the skin (from liquids or other direct contact) with surfaces that contain residual chemical agent

Activity	Description of Operation	OSHA Level PPE ^c	Rationale for PPE Selection
Repairs/Contact with Chemical Agent or Industrial Chemical	Repairs of MMD-1 equipment that could contact chemical agent or industrial chemical waste streams and/or repairs that are performed in the vicinity of possible chemical agent and industrial chemical contamination.	Level B	or industrial chemical. The handling of materials in the MTV may present a hazard to the skin (from liquids or other direct contact) with surfaces that contain residual chemical agent or industrial chemical.
Repairs/No Contact with Chemical Agent or Industrial Chemical	Repairs of MMD-1 equipment that has not contacted chemical agent or industrial chemical waste streams and is not located in an area where chemical agent or industrial chemical contamination is present.	Level D	Activity will be performed when operations have been secured and the area contains no known hazards.

NOTES:

- a Visitor access to MMD-1 areas will be restricted.
- b All visitors must wear safety glasses or equivalent protection, hard hats, and closed-toe shoes.
- c See **Table 7-4** for PPE level definitions.
- d Modified is defined as use of recommended equipment plus optional equipment as defined in **Table 7-5**.

CWM = chemical warfare materiel
 DPG = Dugway Proving Ground
 MTV = munitions treatment vessel
 OSHA = Occupational Safety and Health Administration
 PPE = Personal protective equipment
 SBC = Small Burials Contractor

Table 7-4. OSHA Personal Protective Equipment

OSHA Level	Description	Equipment	
		Recommended	Optional
A	Level A provides the highest level of protection for the skin, eyes, and respiratory system. This level incorporates a fully encapsulating, vapor-tight suit to prevent skin contact of any kind, and a pressure-demand breathing apparatus with supplied air. The Level A garment provides protection against vapor and liquid chemical hazards and is recommended for protection when the chemical hazard is not completely characterized, the atmosphere is oxygen deficient, or the chemical hazard has been identified and requires the highest level of protection for the skin, eyes, and respiratory system.	\$ Positive pressure full-facepiece SCBA or pressure-demand/positive pressure-supplied air respirator with escape SCBA \$ Fully encapsulating, chemical resistant suit \$ Inner and outer chemical-resistant gloves \$ Chemical-resistant safety boots/shoes \$ Two-way radio communications	\$ Cooling unit \$ Coveralls \$ Long cotton underwear \$ Hard hat \$ Disposable gloves and boot covers
B	Level B provides protection for skin and the respiratory system. Level B provides the same respiratory protection as Level A, but offers less protection of the skin from vapors. The Level B garment provides protection against liquids, which may splash on the worker. This garment is also recommended for protection when it has been established that chemical vapors are not present or will not damage or be absorbed through the skin.	\$ Positive pressure full-facepiece SCBA or pressure-demand/positive pressure-supplied air respirator with escape SCBA \$ Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit) \$ Inner and outer chemical-resistant gloves \$ Chemical-resistant safety boots/shoes \$ Hard hat \$ Two-way radio communications	\$ Coveralls \$ Disposable boot covers \$ Face shield \$ Long cotton underwear
C	Level C provides protection against liquids, which may splash on the worker, but does not provide vapor protection. This level	\$ Full-facepiece canister-equipped respirator	\$ Coveralls \$ Disposable boot covers

OSHA Level	Description	Equipment	
		Recommended	Optional
	incorporates a full-face or half-mask air-purifying respirator. Level C is recommended when the chemical hazard is well-established and does not present a hazard to the skin, and when the atmosphere contains at least 19.5-percent oxygen.	\$ Chemical-resistant clothing (overalls and long-sleeved jacket; hooded, one- or two-piece chemical splash suit; disposable chemical-resistant one-piece suit) \$ Inner and outer chemical-resistant gloves \$ Chemical-resistant safety boots/shoes \$ Hard hat \$ Two-way radio communications	\$ Face shield \$ Escape mask \$ Long cotton underwear
D	Level D provides minimum protection and consists of a basic work uniform and additional equipment, as appropriate. Level D may be worn only in areas where there is no possibility of contact with contamination.	\$ Coveralls \$ Safety boots/shoes \$ Safety glasses or chemical splash goggles \$ Hard hat	\$ Gloves \$ Escape mask \$ Face shield

NOTES:

OSHA = Occupational Safety and Health Administration
 SCBA = self-contained breathing apparatus

7.8 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

No ignitable, reactive, or incompatible wastes will be treated in the MMD-1 or stored at the MSM.

7.8.1 Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste [40 CFR 264.17(a); R315-8-2.8]

Although no ignitable, reactive, or incompatible wastes will be treated in the MMD-1 or stored at the MSM, the following precautions will be in place to ensure that ignition of combustible materials or reaction of wastes does not occur:

- \$ The entire Building 3445 (including the MSM) is designated as a non-smoking area, and no personal ignition sources (such as matches, lighters, etc.) will be allowed within the area. No smoking signs are conspicuously displayed inside and outside the building.
- \$ All construction materials comprising the MMD-1 system are compatible with the wastes to be stored or treated. In addition, all wastes will be compatible with the hazardous waste containers that will hold the waste prior to shipment offsite to an approved hazardous waste treatment, storage, and disposal facility (TSDF).
- \$ All electrical wiring and equipment are in compliance with National Fire Protection Association codes.
- \$ Open flame, cutting, and welding will not be allowed in Building 3445 unless repair is required, in which case the equipment will be secured and open flame or sources will be isolated from other equipment and wastes.
- \$ Potentially vigorous reactions (for example, chemical agent and reagents) will occur in high-pressure rated vessels.
- \$ Treatment operations will be conducted by chemical agent/industrial chemical campaign. Therefore, the MMD-1 system will only process one type of chemical agent or industrial chemical at a time. In addition, the MMD-1 MTV will be rinsed with water between campaigns to prevent cross-contamination or mixing of different chemical agents or industrial chemicals.
- \$ Only one type of chemical agent or industrial chemical will be stored at the MSM at any time, based on campaign.

7.8.2 General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste [40 CFR 264.17(b); R315-8-2.8]

All chemical reagents and waste streams present in the MMD-1 will be contained and managed in such a way as to prevent any action that could promote a chemical reaction, fire, or explosion. No ignitable, reactive, or incompatible wastes will be treated. The wastes that are to be detoxified will be mixed in a controlled manner within the MMD-1 reactor vessels specially designed for high pressures. In addition, only one type of chemical agent or industrial chemical will be processed at a time.

The detoxification reactions will occur in the reactor vessels within the process trailer. Process parameters such as temperature and pressure will be monitored and corrective actions initiated when process values deviate from established operating ranges. These monitoring and control measures, as well as the design of the liquid processing, gas processing, and waste gas processing systems, will ensure that the detoxification will not generate extreme heat or pressure, fire or explosions, or violent reactions.

The detoxification process will primarily occur in the MTV reactor vessel, which will be sealed shut during all detoxification. It will not be opened except in an emergency situation or until the temperature, pressure, and chemical agent or industrial chemical concentrations in the MTV vapor are below the performance goal levels listed in **Attachment 4, Table 4-5**.

The detoxification reactions will not produce uncontrolled flammable fumes, dusts, or gases, nor will the reaction pose a risk of fire or explosion.

The reaction will not damage the structural integrity of the MMD-1 treatment system vessels or the process trailer. The process trailer and Building 3445, East Chamber will be maintained under negative pressure whenever MMD-1 operations are being conducted. All process air from the process trailer will be exhausted through a carbon filtration unit before exiting the process trailer, and will then be vented to the Building 3445, East Chamber activated carbon filter system before exiting Building 3445, East Chamber. These preventive measures will ensure that the detoxification reactions to be conducted will not pose any threat to human health or the environment from gaseous releases. DOT approved containers will be used to store and transport liquid and solid hazardous wastes generated from the MMD-1 test and will be compatible with all waste to be stored in them. A list of DOT approved containers that will be used to store MMD-1 process wastes is provided in Section 5.